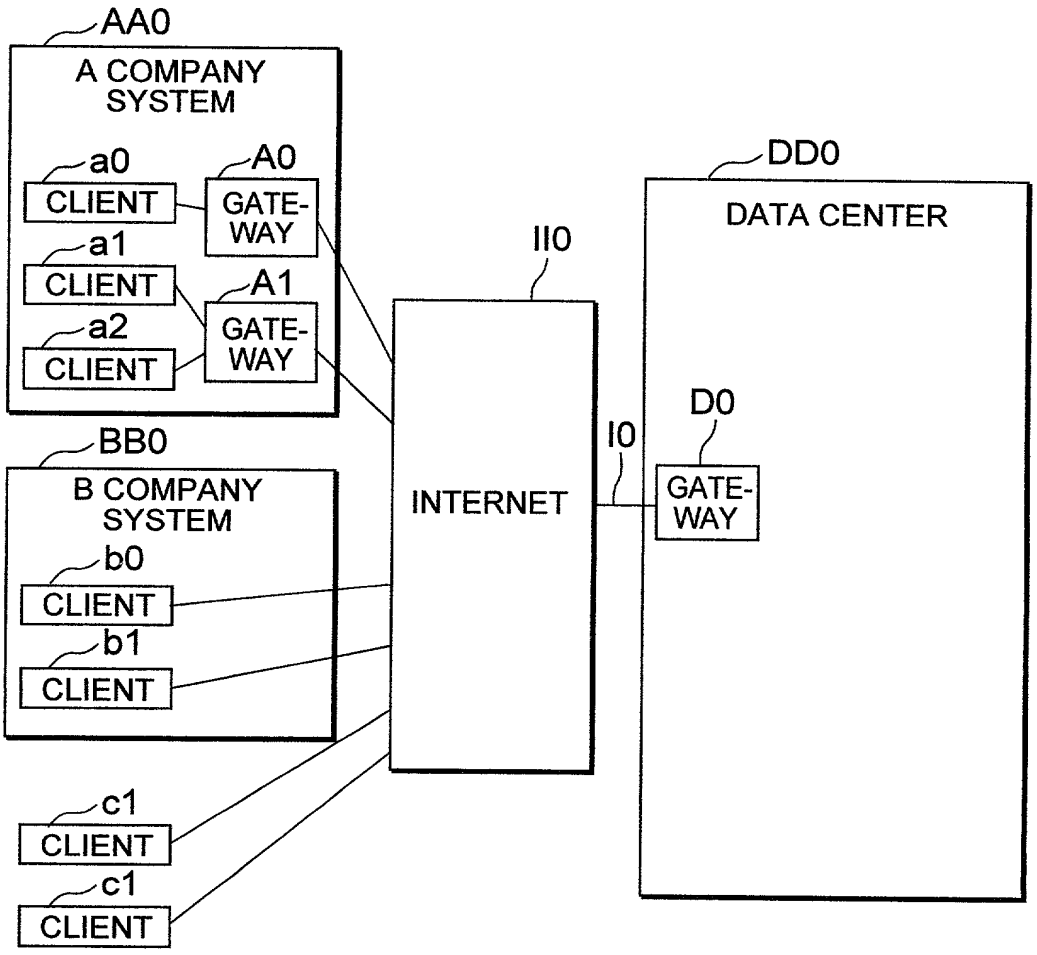
FIG. 1


AA0
A COMPANY SYSTEM
a0
CLIENT
A0
GATE-WAY
a1
CLIENT
A1
a2
CLIENT
GATE-WAY
BB0
B COMPANY SYSTEM
b0
CLIENT
b1
CLIENT
c1
CLIENT
c1
CLIENT
II0
INTERNET
I0
DD0
DATA CENTER
D0
GATE-WAY

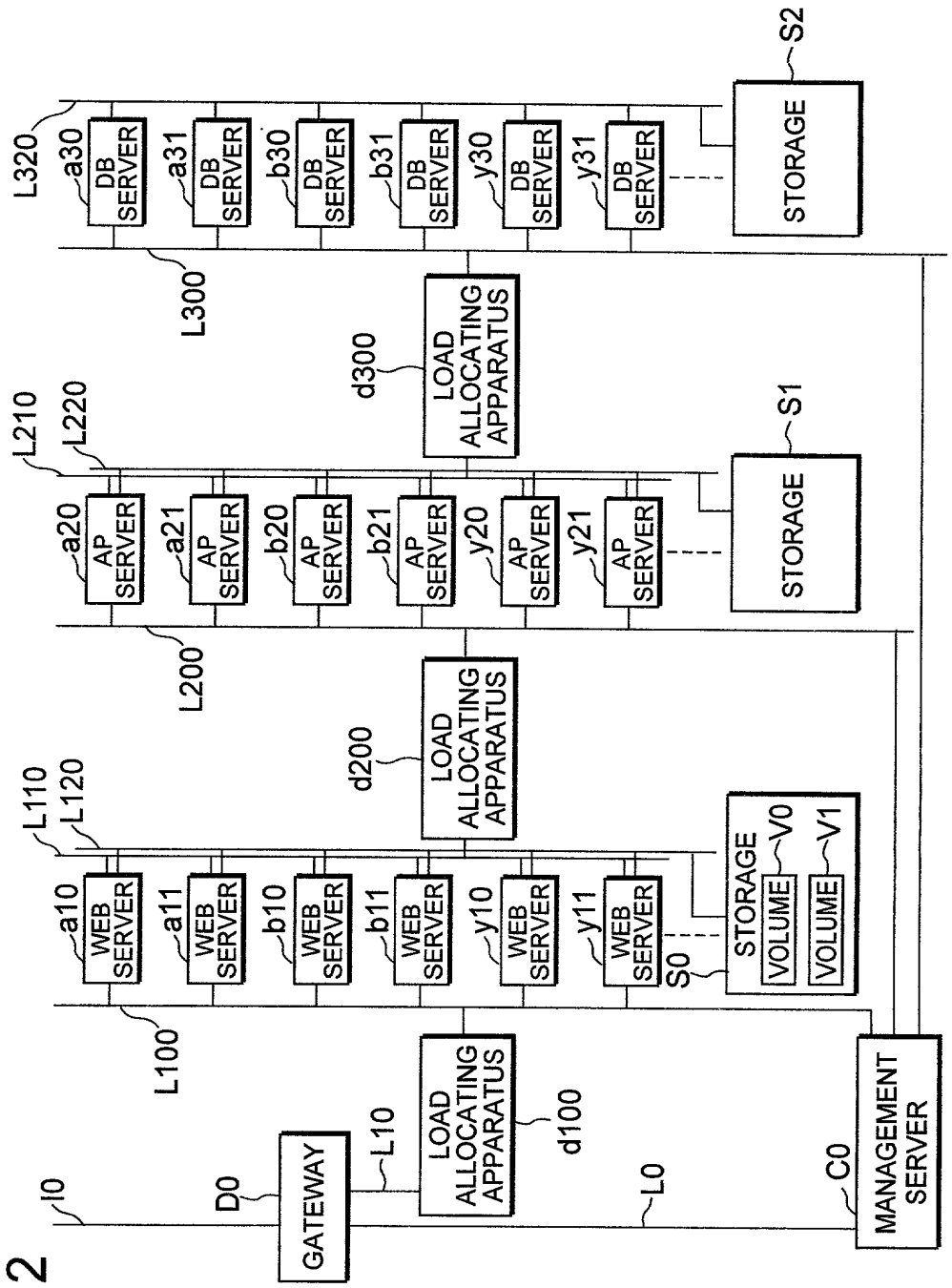


FIG. 2

FIG. 3

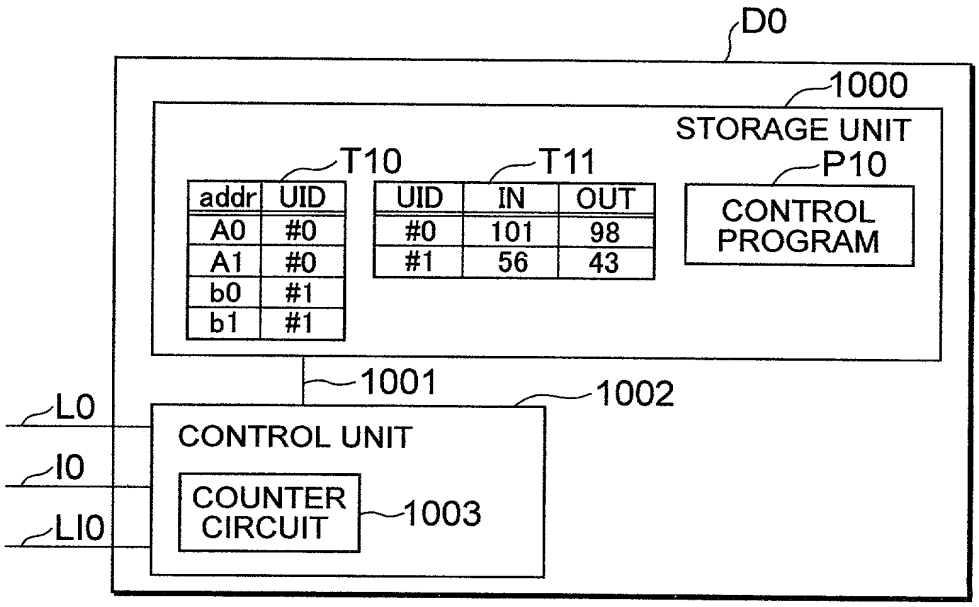

D0
1000
STORAGE UNIT
T10
addr
UID
A0
#0
A1
#0
b0
#1
b1
#1
T11
UID
IN
OUT
#0
101
98
#1
56
43
P10
CONTROL PROGRAM
1001
1002
L0
I0
LI0
CONTROL UNIT
COUNTER CIRCUIT
1003

FIG. 4

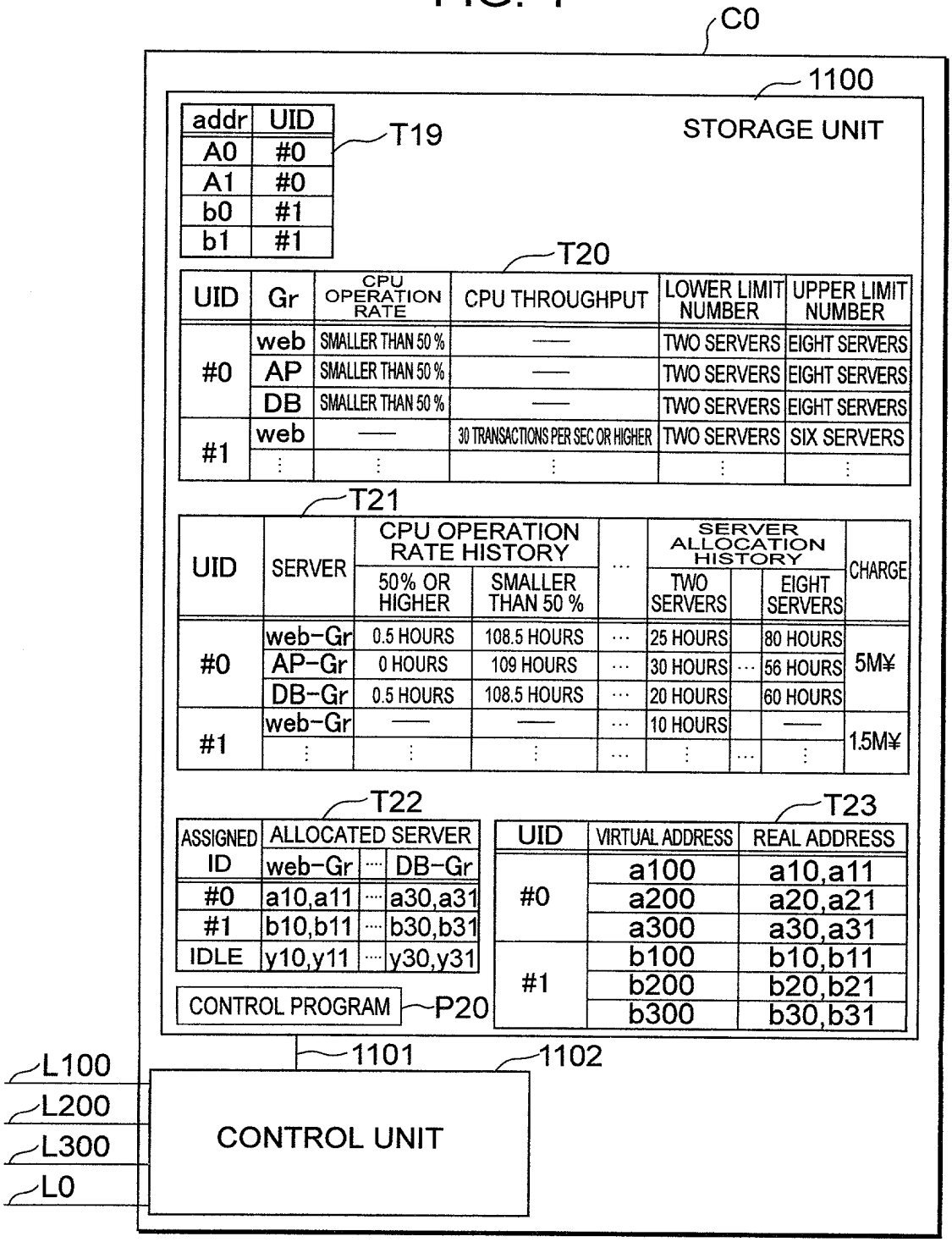

C0
1100
STORAGE UNIT
T19
addr | UID
A0 | #0
A1 | #0
b0 | #1
b1 | #1
T20
UID | Gr | CPU OPERATION RATE | CPU THROUGHPUT | LOWER LIMIT NUMBER | UPPER LIMIT NUMBER
#0 | web | SMALLER THAN 50 % | — | TWO SERVERS | EIGHT SERVERS
#0 | AP | SMALLER THAN 50 % | — | TWO SERVERS | EIGHT SERVERS
#0 | DB | SMALLER THAN 50 % | — | TWO SERVERS | EIGHT SERVERS
#1 | web | — | 30 TRANSACTIONS PER SEC OR HIGHER | TWO SERVERS | SIX SERVERS
T21
UID | SERVER | CPU OPERATION RATE HISTORY | | … | SERVER ALLOCATION HISTORY | | | CHARGE
50% OR HIGHER | SMALLER THAN 50 % | TWO SERVERS | EIGHT SERVERS
#0 | web-Gr | 0.5 HOURS | 108.5 HOURS | … | 25 HOURS | | 80 HOURS | 5M¥
#0 | AP-Gr | 0 HOURS | 109 HOURS | … | 30 HOURS | … | 56 HOURS | 5M¥
#0 | DB-Gr | 0.5 HOURS | 108.5 HOURS | … | 20 HOURS | | 60 HOURS | 5M¥
#1 | web-Gr | — | — | … | 10 HOURS | | — | 1.5M¥
T22
ASSIGNED ID | ALLOCATED SERVER | | | | | | | |
web-Gr | … | DB-Gr
#0 | a10,a11 | … | a30,a31
#1 | b10,b11 | … | b30,b31
IDLE | y10,y11 | … | y30,y31
T23
UID | VIRTUAL ADDRESS | REAL ADDRESS
#0 | a100 | a10,a11
#0 | a200 | a20,a21
#0 | a300 | a30,a31
#1 | b100 | b10,b11
#1 | b200 | b20,b21
#1 | b300 | b30,b31
CONTROL PROGRAM
P20
1101
1102
CONTROL UNIT
L100
L200
L300
L0

FIG. 5

(A)

T30

UID	VIRTUAL ADDRESS	REAL ADDRESS
#0	a100	a10,a11
	b100	b10,b11

(B)

T31

UID	VIRTUAL ADDRESS	REAL ADDRESS
#0	a100	a10,a11
	a200	a20,a21
#1	b100	b10,b11
	b200	b20,b21

(C)

T32

UID	VIRTUAL ADDRESS	REAL ADDRESS
#0	a200	a20,a21
	a300	a30,a31
#1	b200	b20,b21
	b300	b30,b31

FIG. 6

T33

UID	VOLUME
#0	V0
#1	V1

FIG. 7

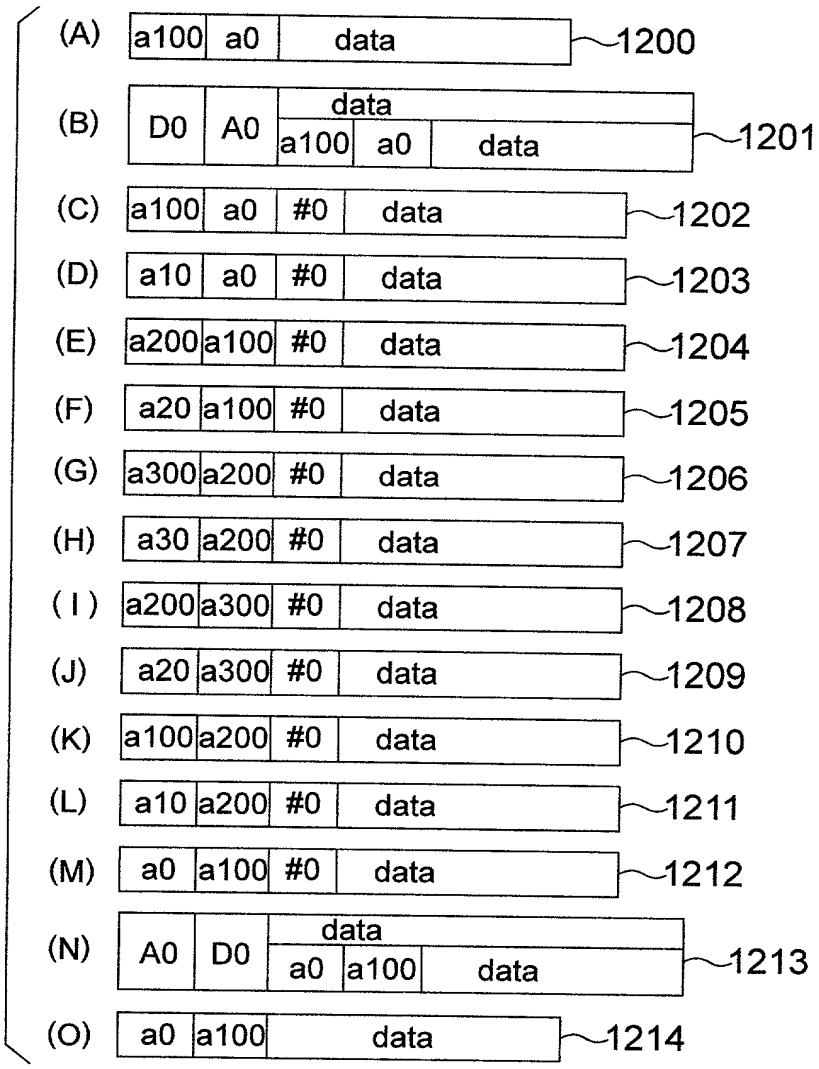

(A)
a100
a0
data
1200
(B)
D0
A0
data
a100
a0
data
1201
(C)
a100
a0
#0
data
1202
(D)
a10
a0
#0
data
1203
(E)
a200
a100
#0
data
1204
(F)
a20
a100
#0
data
1205
(G)
a300
a200
#0
data
1206
(H)
a30
a200
#0
data
1207
(I)
a200
a300
#0
data
1208
(J)
a20
a300
#0
data
1209
(K)
a100
a200
#0
data
1210
(L)
a10
a200
#0
data
1211
(M)
a0
a100
#0
data
1212
(N)
A0
D0
data
a0
a100
data
1213
(O)
a0
a100
data
1214

FIG. 8

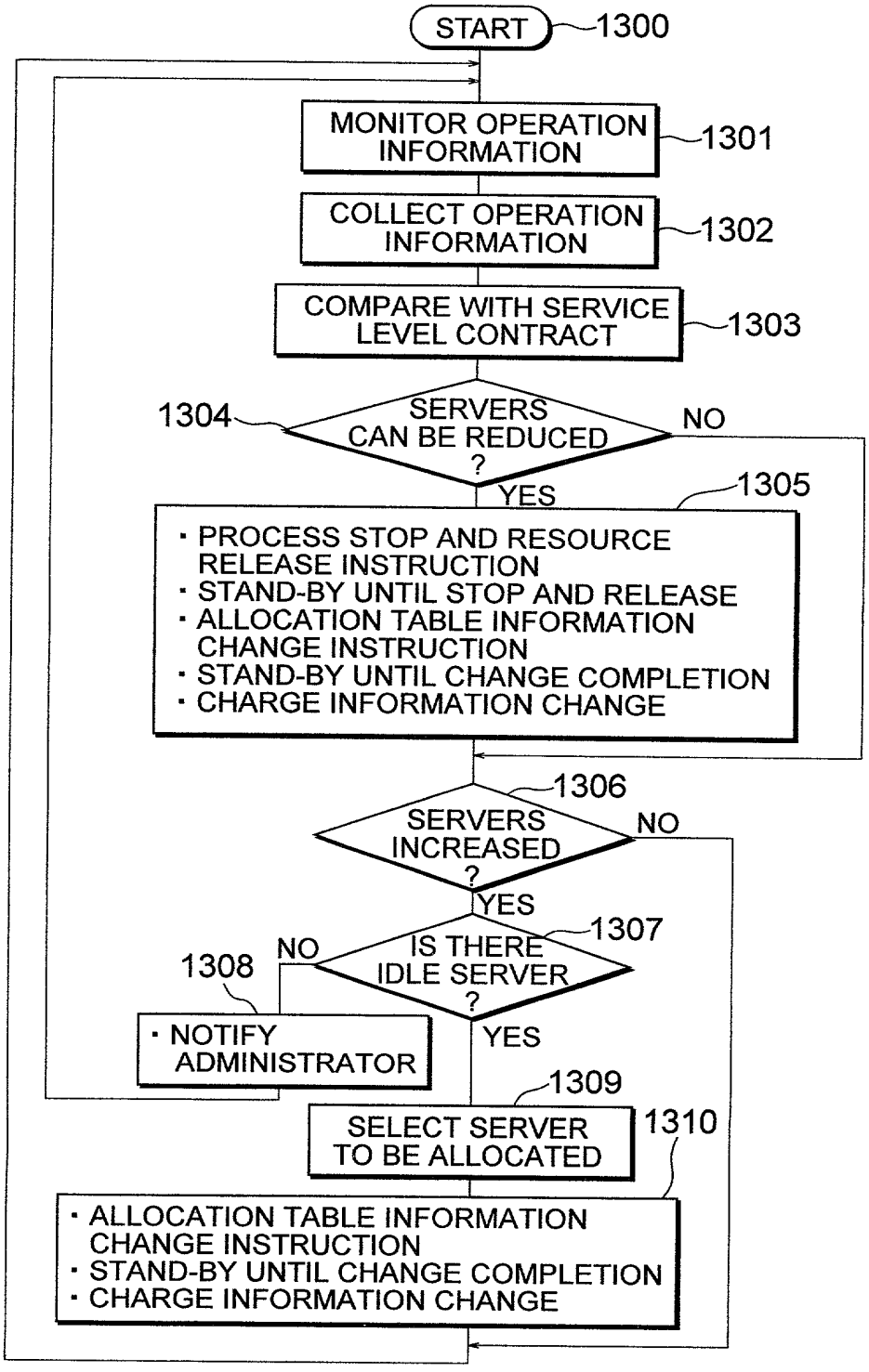

START
1300
MONITOR OPERATION INFORMATION
1301
COLLECT OPERATION INFORMATION
1302
COMPARE WITH SERVICE LEVEL CONTRACT
1303
1304
SERVERS CAN BE REDUCED ?
NO
YES
1305
・PROCESS STOP AND RESOURCE RELEASE INSTRUCTION
・STAND-BY UNTIL STOP AND RELEASE
・ALLOCATION TABLE INFORMATION CHANGE INSTRUCTION
・STAND-BY UNTIL CHANGE COMPLETION
・CHARGE INFORMATION CHANGE
1306
SERVERS INCREASED ?
NO
YES
1307
IS THERE IDLE SERVER ?
NO
1308
・NOTIFY ADMINISTRATOR
YES
1309
SELECT SERVER TO BE ALLOCATED
1310
・ALLOCATION TABLE INFORMATION CHANGE INSTRUCTION
・STAND-BY UNTIL CHANGE COMPLETION
・CHARGE INFORMATION CHANGE

FIG. 9

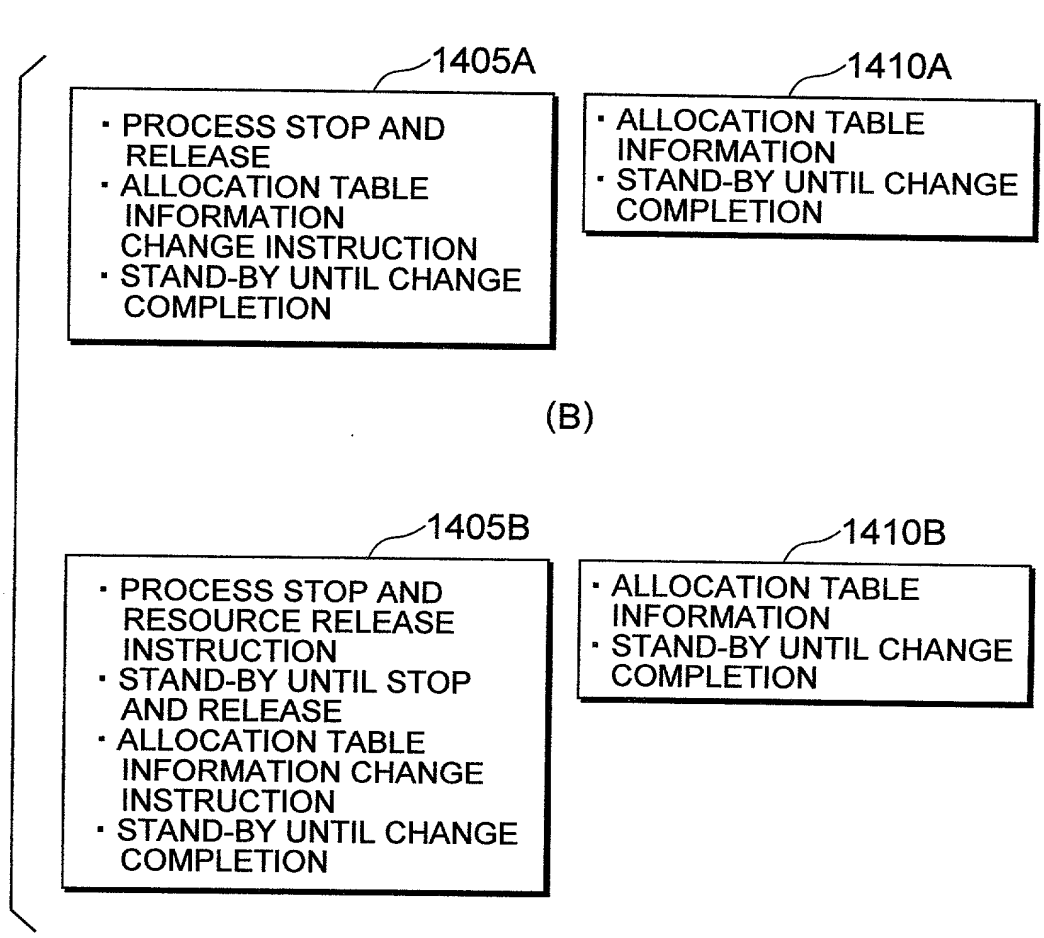

(A)
1405A
· PROCESS STOP AND RELEASE
· ALLOCATION TABLE INFORMATION CHANGE INSTRUCTION
· STAND-BY UNTIL CHANGE COMPLETION
1410A
· ALLOCATION TABLE INFORMATION
· STAND-BY UNTIL CHANGE COMPLETION
(B)
1405B
· PROCESS STOP AND RESOURCE RELEASE INSTRUCTION
· STAND-BY UNTIL STOP AND RELEASE
· ALLOCATION TABLE INFORMATION CHANGE INSTRUCTION
· STAND-BY UNTIL CHANGE COMPLETION
1410B
· ALLOCATION TABLE INFORMATION
· STAND-BY UNTIL CHANGE COMPLETION

FIG. 10

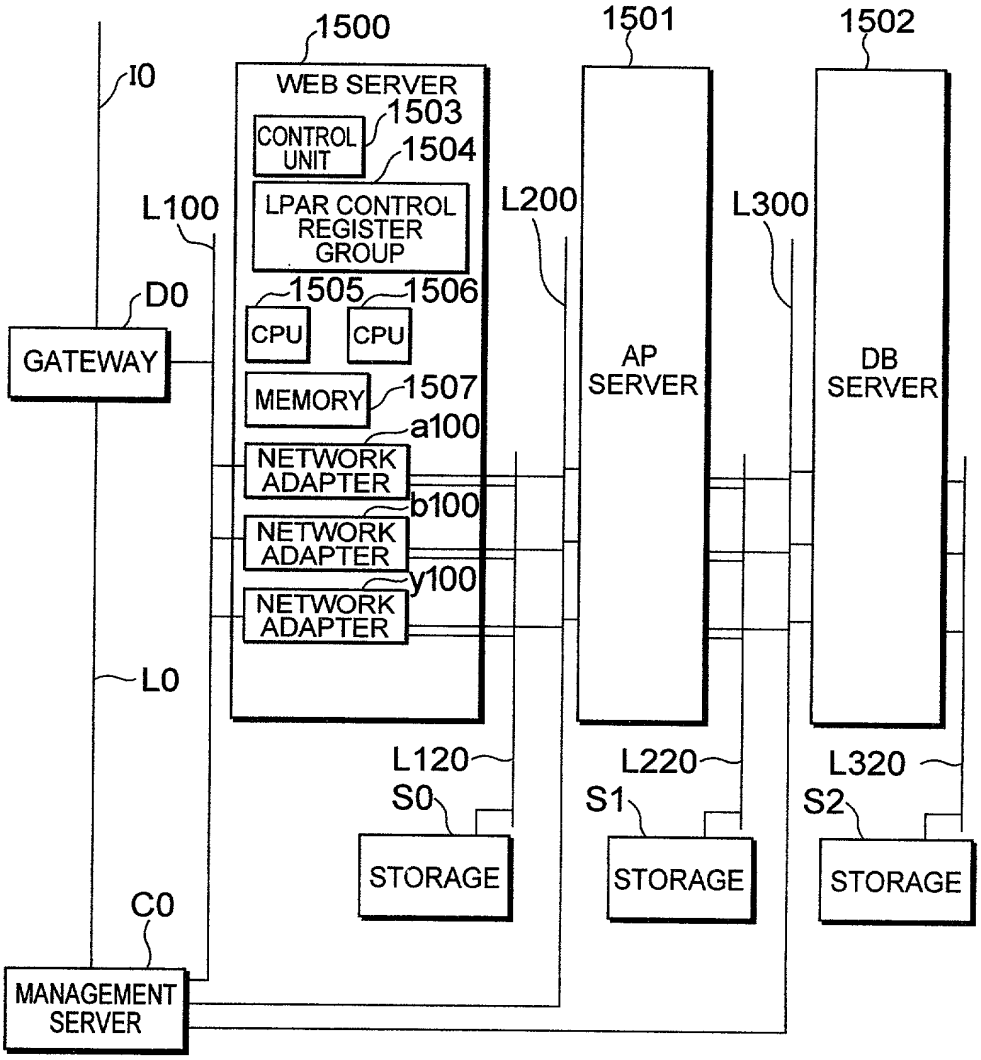


FIG. 11

T40

LPAR#	UID	ADAPTER	MEMORY ALLOCATION		CPU ALLOCATION%
			START OFFSET	SIZE	
#0	#0	a100	0	2GB	50%
#1	#1	b100	2GB	2GB	20%
#2	not assign	y100	4GB	2GB	disable

FIG. 12

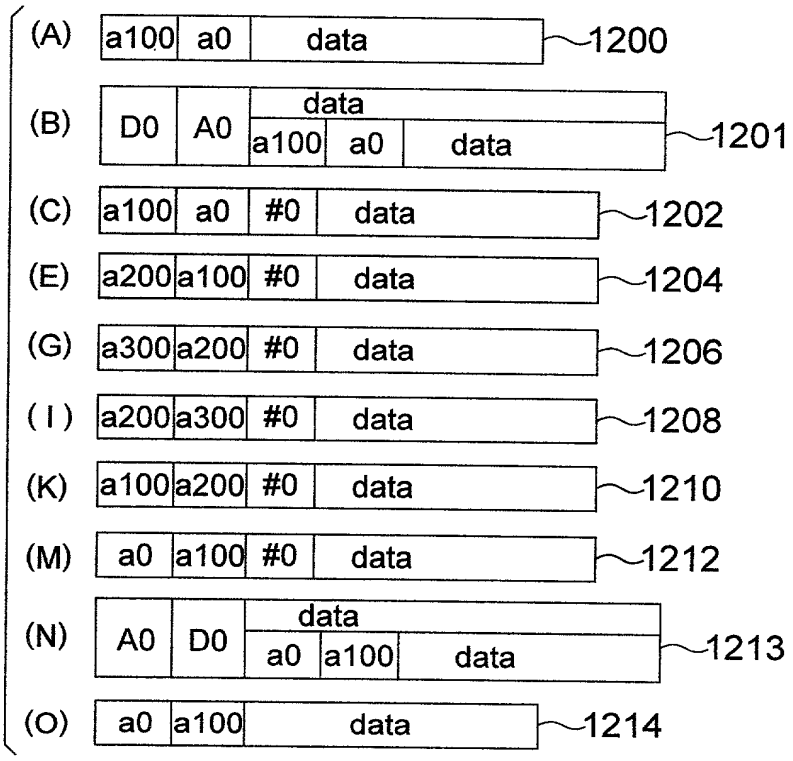

(A)
a100
a0
data
1200
(B)
D0
A0
data
a100
a0
data
1201
(C)
a100
a0
#0
data
1202
(E)
a200
a100
#0
data
1204
(G)
a300
a200
#0
data
1206
(I)
a200
a300
#0
data
1208
(K)
a100
a200
#0
data
1210
(M)
a0
a100
#0
data
1212
(N)
A0
D0
data
a0
a100
data
1213
(O)
a0
a100
data
1214

FIG. 13

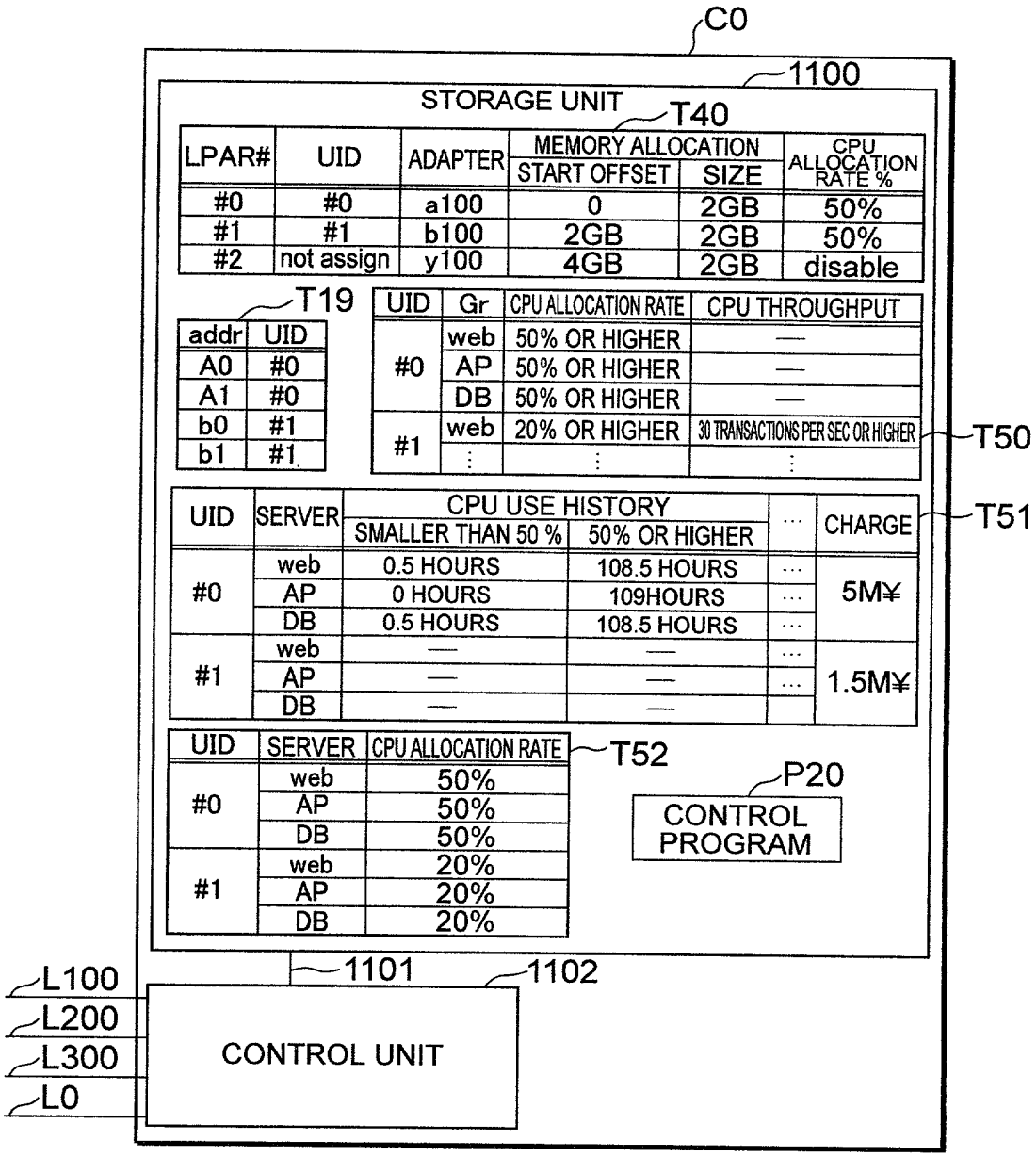

C0
1100
STORAGE UNIT
T40
LPAR# | UID | ADAPTER | MEMORY ALLOCATION START OFFSET | MEMORY ALLOCATION SIZE | CPU ALLOCATION RATE %
#0 | #0 | a100 | 0 | 2GB | 50%
#1 | #1 | b100 | 2GB | 2GB | 50%
#2 | not assign | y100 | 4GB | 2GB | disable
T19
addr | UID
A0 | #0
A1 | #0
b0 | #1
b1 | #1
UID | Gr | CPU ALLOCATION RATE | CPU THROUGHPUT
#0 | web | 50% OR HIGHER | —
#0 | AP | 50% OR HIGHER | —
#0 | DB | 50% OR HIGHER | —
#1 | web | 20% OR HIGHER | 30 TRANSACTIONS PER SEC OR HIGHER
T50
UID | SERVER | CPU USE HISTORY SMALLER THAN 50 % | CPU USE HISTORY 50% OR HIGHER | ... | CHARGE
T51
#0 | web | 0.5 HOURS | 108.5 HOURS | ... | 5M¥
#0 | AP | 0 HOURS | 109HOURS | ... |
#0 | DB | 0.5 HOURS | 108.5 HOURS | ... |
#1 | web | — | — | ... | 1.5M¥
#1 | AP | — | — | ... |
#1 | DB | — | — | ... |
UID | SERVER | CPU ALLOCATION RATE
T52
#0 | web | 50%
#0 | AP | 50%
#0 | DB | 50%
#1 | web | 20%
#1 | AP | 20%
#1 | DB | 20%
P20
CONTROL PROGRAM
1101
1102
L100
L200
L300
L0
CONTROL UNIT

FIG. 14

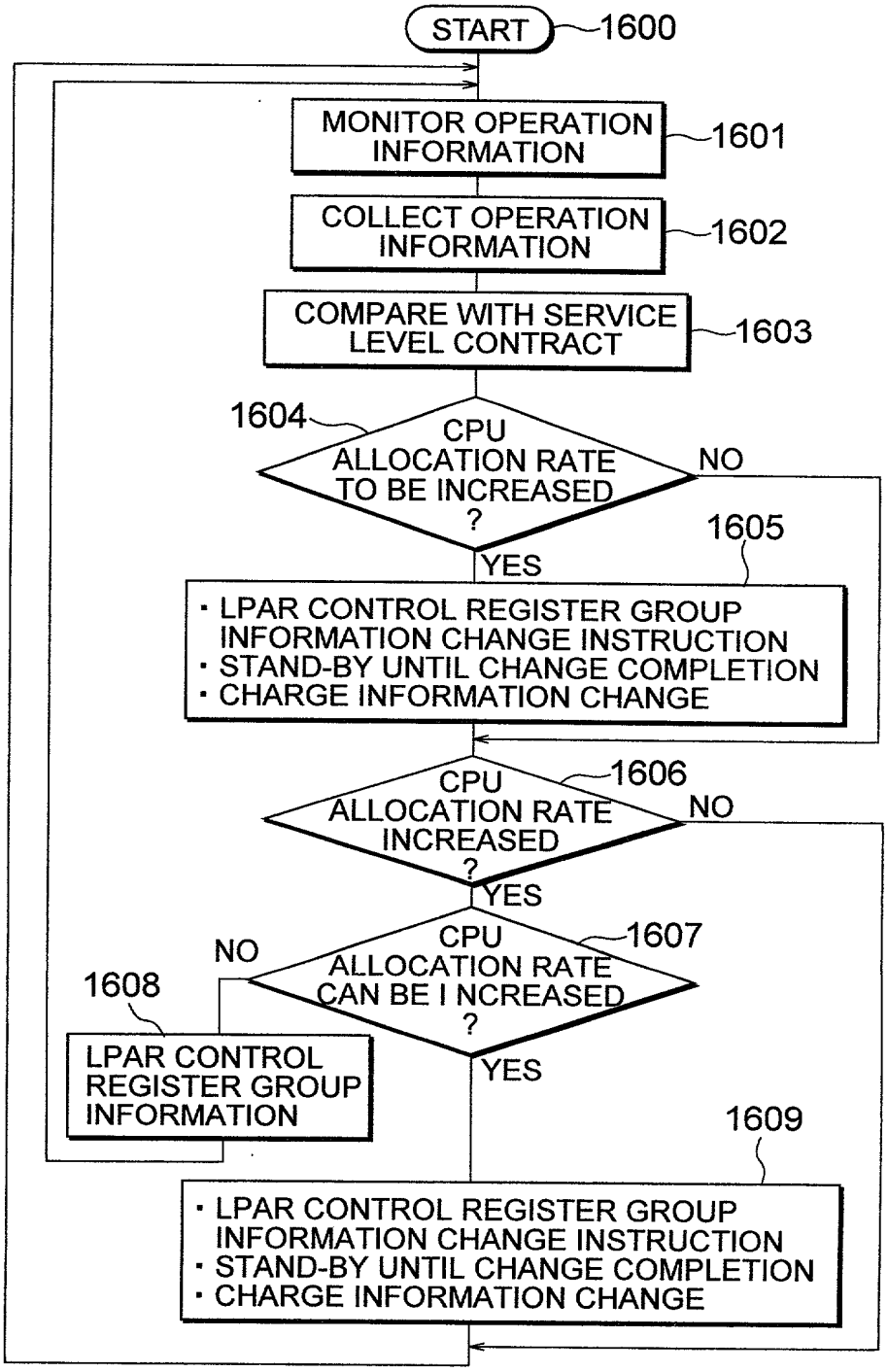

START
1600
MONITOR OPERATION INFORMATION
1601
COLLECT OPERATION INFORMATION
1602
COMPARE WITH SERVICE LEVEL CONTRACT
1603
1604
CPU ALLOCATION RATE TO BE INCREASED ?
NO
YES
1605
• LPAR CONTROL REGISTER GROUP INFORMATION CHANGE INSTRUCTION
• STAND-BY UNTIL CHANGE COMPLETION
• CHARGE INFORMATION CHANGE
1606
CPU ALLOCATION RATE INCREASED ?
NO
YES
1607
CPU ALLOCATION RATE CAN BE I NCREASED ?
NO
YES
1608
LPAR CONTROL REGISTER GROUP INFORMATION
1609
• LPAR CONTROL REGISTER GROUP INFORMATION CHANGE INSTRUCTION
• STAND-BY UNTIL CHANGE COMPLETION
• CHARGE INFORMATION CHANGE

FIG. 15

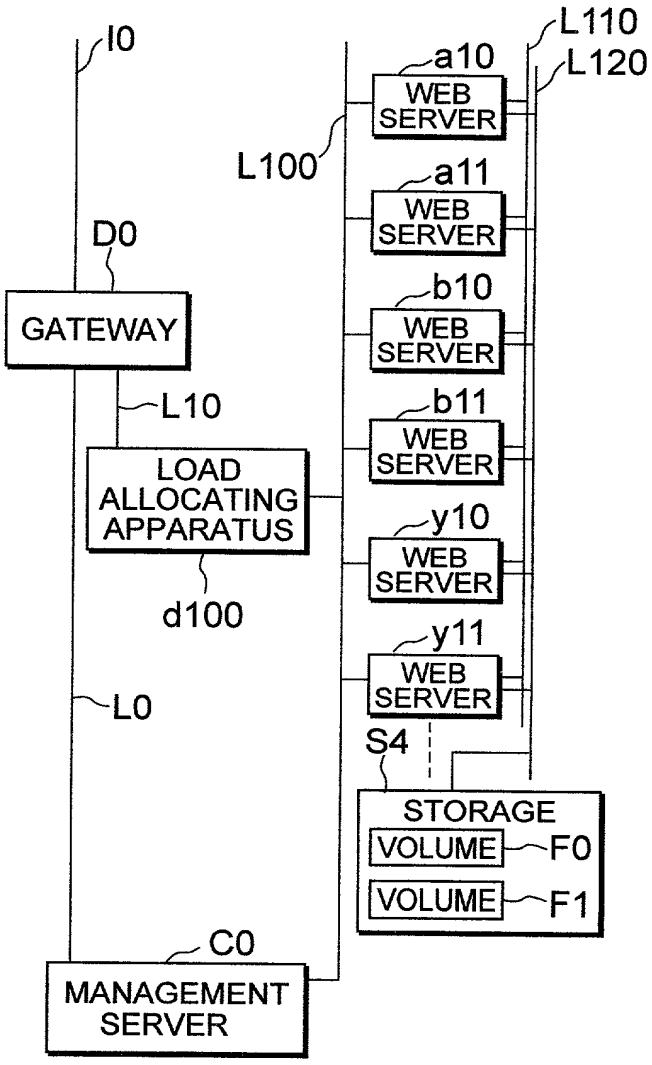

I0
D0
GATEWAY
L10
LOAD ALLOCATING APPARATUS
d100
L0
C0
MANAGEMENT SERVER
L100
L110
L120
a10
WEB SERVER
a11
WEB SERVER
b10
WEB SERVER
b11
WEB SERVER
y10
WEB SERVER
y11
WEB SERVER
S4
STORAGE
VOLUME
F0
VOLUME
F1

FIG. 16

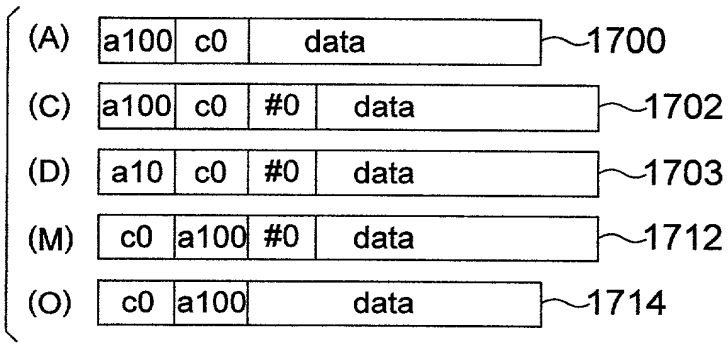

(A)
a100
c0
data
1700
(C)
a100
c0
#0
data
1702
(D)
a10
c0
#0
data
1703
(M)
c0
a100
#0
data
1712
(O)
c0
a100
data
1714

FIG. 17

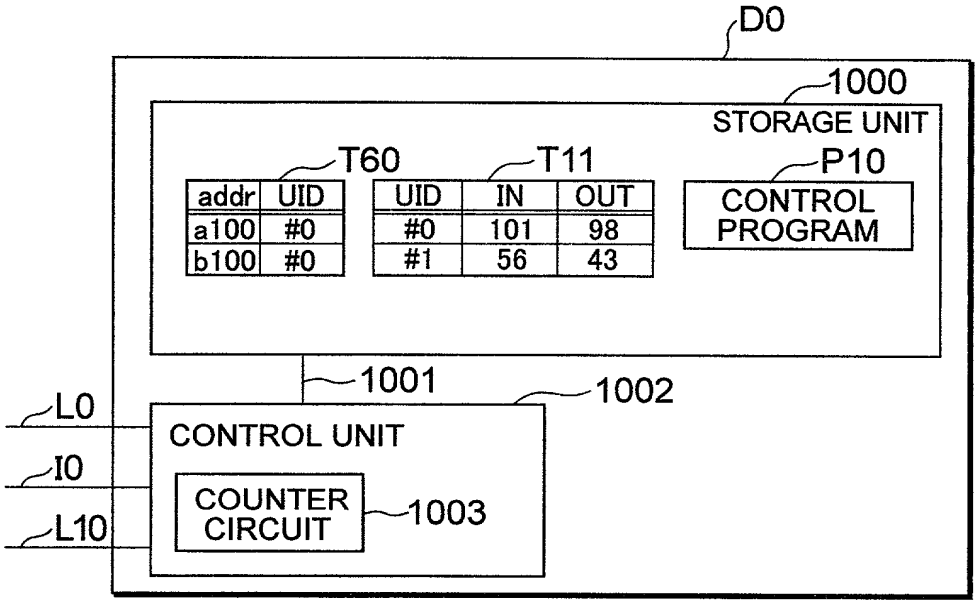

D0
1000
STORAGE UNIT
T60
addr
UID
a100
#0
b100
#0
T11
UID
IN
OUT
#0
101
98
#1
56
43
P10
CONTROL PROGRAM
1001
1002
L0
I0
L10
CONTROL UNIT
COUNTER CIRCUIT
1003

FIG. 18

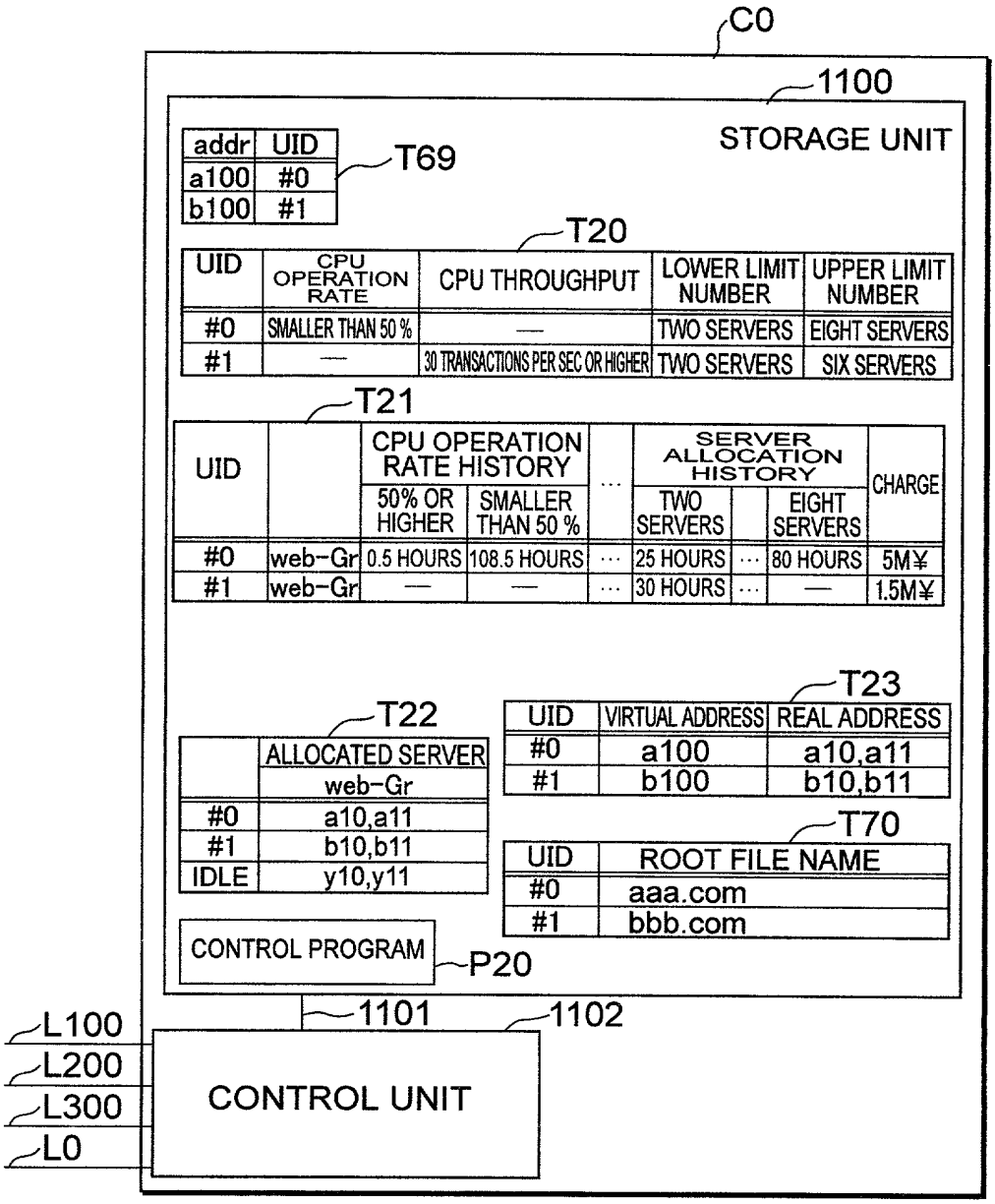

C0
1100
STORAGE UNIT
T69
addr | UID
a100 | #0
b100 | #1
T20
UID | CPU OPERATION RATE | CPU THROUGHPUT | LOWER LIMIT NUMBER | UPPER LIMIT NUMBER
#0 | SMALLER THAN 50 % | — | TWO SERVERS | EIGHT SERVERS
#1 | — | 30 TRANSACTIONS PER SEC OR HIGHER | TWO SERVERS | SIX SERVERS
T21
UID | | CPU OPERATION RATE HISTORY | ... | SERVER ALLOCATION HISTORY | | | CHARGE
50% OR HIGHER | SMALLER THAN 50 % | TWO SERVERS | EIGHT SERVERS
#0 | web-Gr | 0.5 HOURS | 108.5 HOURS | ... | 25 HOURS | ... | 80 HOURS | 5M¥
#1 | web-Gr | — | — | ... | 30 HOURS | ... | — | 1.5M¥
T22
ALLOCATED SERVER
web-Gr
#0 | a10,a11
#1 | b10,b11
IDLE | y10,y11
T23
UID | VIRTUAL ADDRESS | REAL ADDRESS
#0 | a100 | a10,a11
#1 | b100 | b10,b11
T70
UID | ROOT FILE NAME
#0 | aaa.com
#1 | bbb.com
CONTROL PROGRAM
P20
1101
1102
CONTROL UNIT
L100
L200
L300
L0

FIG. 19

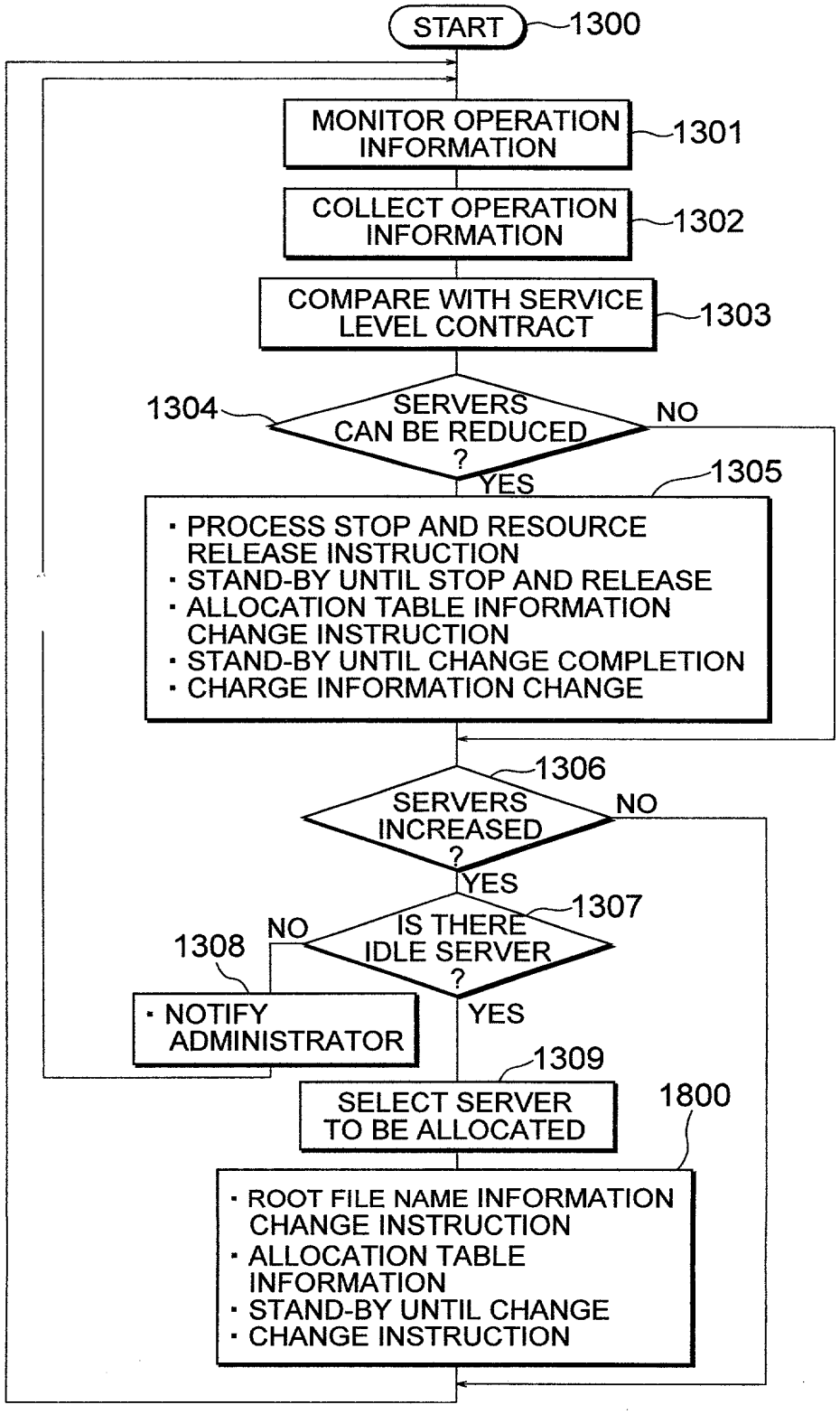

START
1300
MONITOR OPERATION INFORMATION
1301
COLLECT OPERATION INFORMATION
1302
COMPARE WITH SERVICE LEVEL CONTRACT
1303
1304
SERVERS CAN BE REDUCED ?
NO
YES
1305
• PROCESS STOP AND RESOURCE RELEASE INSTRUCTION
• STAND-BY UNTIL STOP AND RELEASE
• ALLOCATION TABLE INFORMATION CHANGE INSTRUCTION
• STAND-BY UNTIL CHANGE COMPLETION
• CHARGE INFORMATION CHANGE
1306
SERVERS INCREASED ?
NO
YES
1307
IS THERE IDLE SERVER ?
NO
1308
• NOTIFY ADMINISTRATOR
YES
1309
SELECT SERVER TO BE ALLOCATED
1800
• ROOT FILE NAME INFORMATION CHANGE INSTRUCTION
• ALLOCATION TABLE INFORMATION
• STAND-BY UNTIL CHANGE
• CHANGE INSTRUCTION

FIG. 20

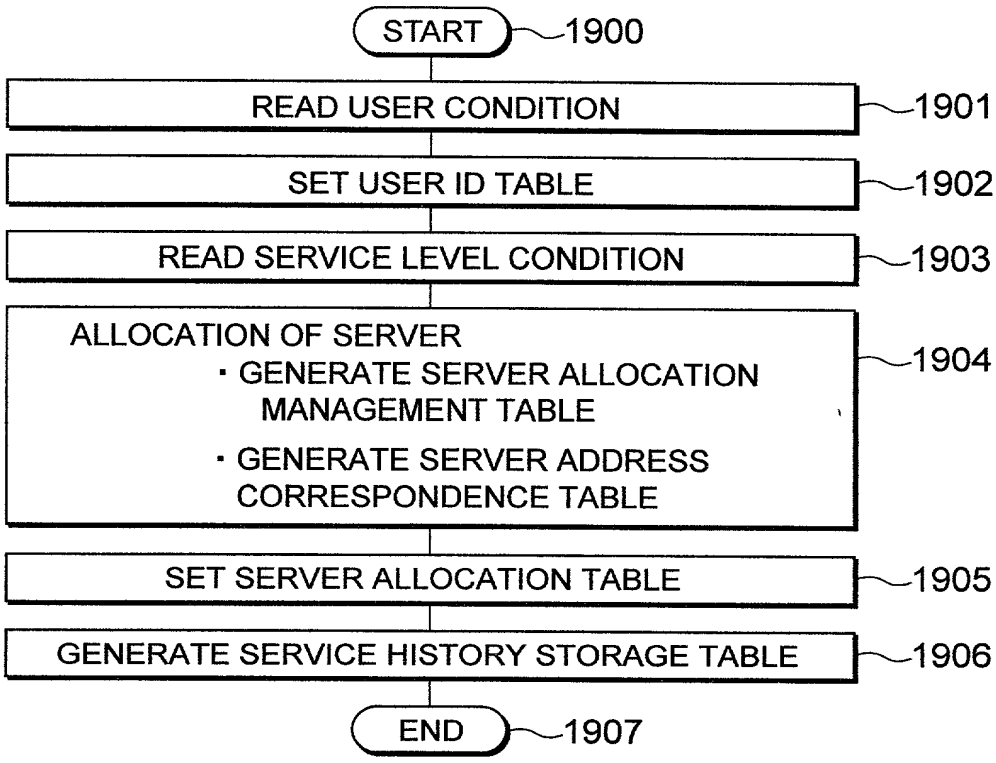

START
1900
READ USER CONDITION
1901
SET USER ID TABLE
1902
READ SERVICE LEVEL CONDITION
1903
ALLOCATION OF SERVER
· GENERATE SERVER ALLOCATION MANAGEMENT TABLE
· GENERATE SERVER ADDRESS CORRESPONDENCE TABLE
1904
SET SERVER ALLOCATION TABLE
1905
GENERATE SERVICE HISTORY STORAGE TABLE
1906
END
1907

FIG. 21

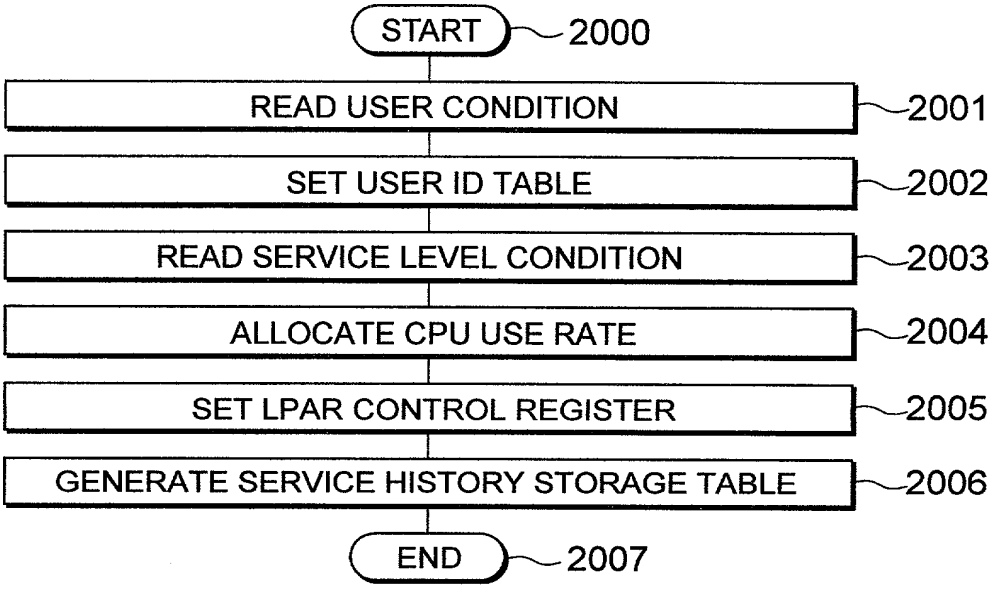

START
2000
READ USER CONDITION
2001
SET USER ID TABLE
2002
READ SERVICE LEVEL CONDITION
2003
ALLOCATE CPU USE RATE
2004
SET LPAR CONTROL REGISTER
2005
GENERATE SERVICE HISTORY STORAGE TABLE
2006
END
2007

FIG. 22

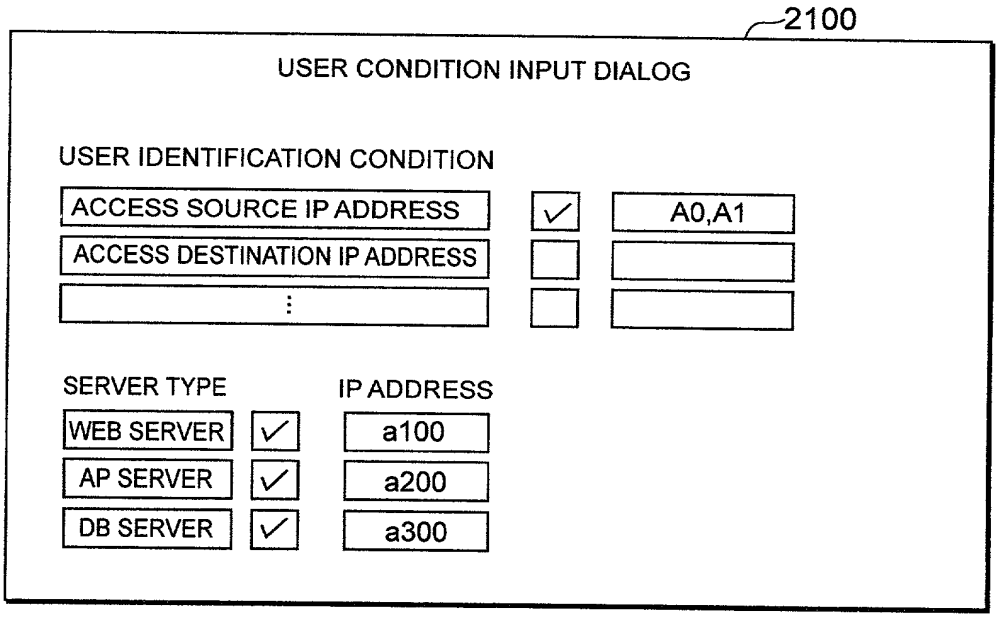

2100
USER CONDITION INPUT DIALOG
USER IDENTIFICATION CONDITION
ACCESS SOURCE IP ADDRESS
A0,A1
ACCESS DESTINATION IP ADDRESS
SERVER TYPE
IP ADDRESS
WEB SERVER
a100
AP SERVER
a200
DB SERVER
a300

FIG. 23

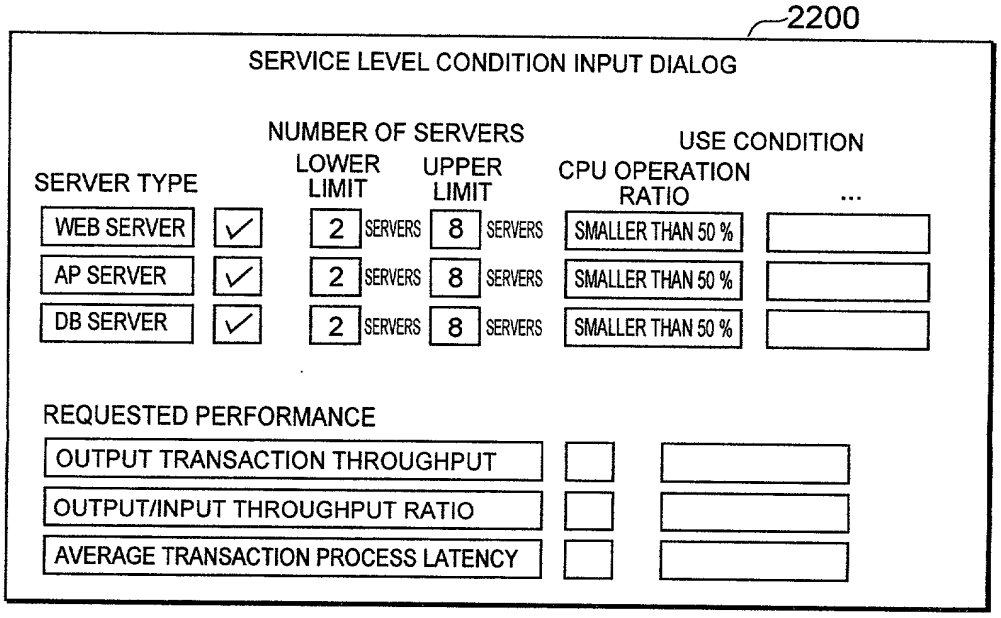

2200
SERVICE LEVEL CONDITION INPUT DIALOG
NUMBER OF SERVERS
USE CONDITION
SERVER TYPE
LOWER LIMIT
UPPER LIMIT
CPU OPERATION RATIO
...
WEB SERVER
2 SERVERS
8 SERVERS
SMALLER THAN 50 %
AP SERVER
2 SERVERS
8 SERVERS
SMALLER THAN 50 %
DB SERVER
2 SERVERS
8 SERVERS
SMALLER THAN 50 %
REQUESTED PERFORMANCE
OUTPUT TRANSACTION THROUGHPUT
OUTPUT/INPUT THROUGHPUT RATIO
AVERAGE TRANSACTION PROCESS LATENCY

FIG. 24

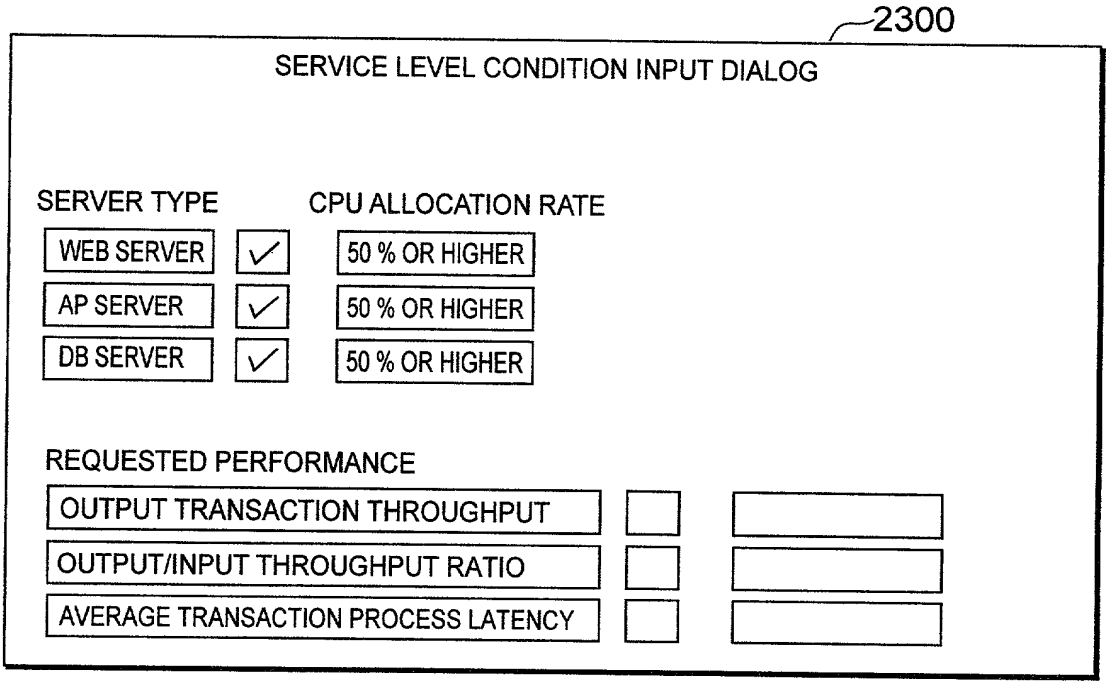
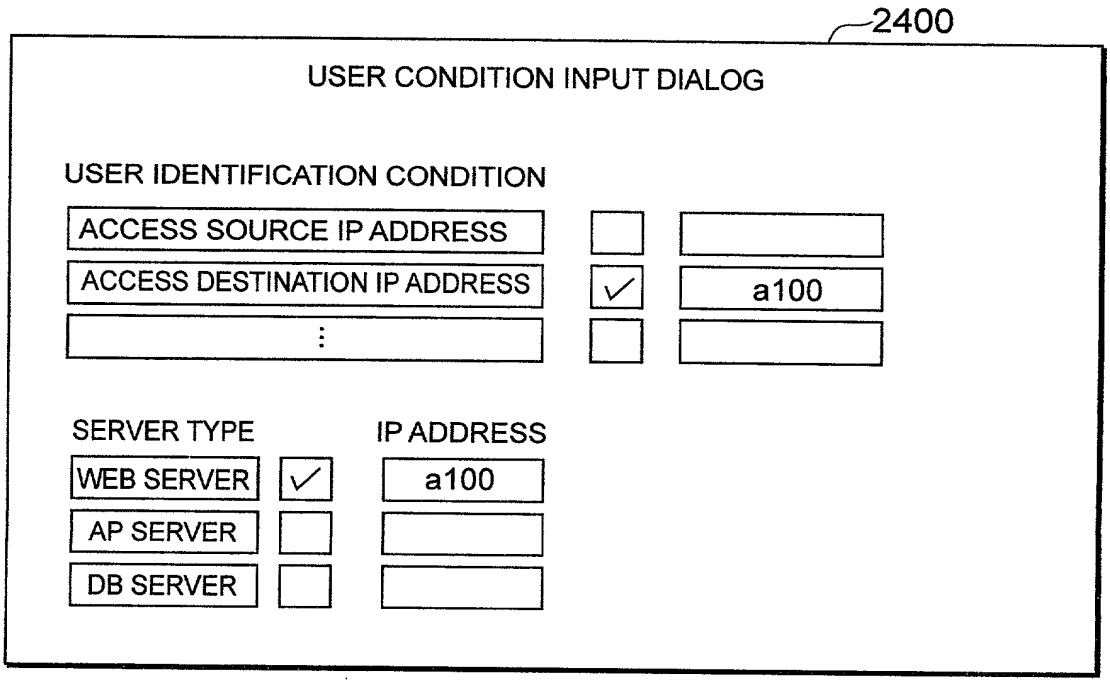

2300
SERVICE LEVEL CONDITION INPUT DIALOG
SERVER TYPE
CPU ALLOCATION RATE
WEB SERVER
✓
50 % OR HIGHER
AP SERVER
✓
50 % OR HIGHER
DB SERVER
✓
50 % OR HIGHER
REQUESTED PERFORMANCE
OUTPUT TRANSACTION THROUGHPUT
OUTPUT/INPUT THROUGHPUT RATIO
AVERAGE TRANSACTION PROCESS LATENCY

FIG. 25


2400
USER CONDITION INPUT DIALOG
USER IDENTIFICATION CONDITION
ACCESS SOURCE IP ADDRESS
ACCESS DESTINATION IP ADDRESS
✓
a100
SERVER TYPE
IP ADDRESS
WEB SERVER
✓
a100
AP SERVER
DB SERVER